

REMARKS

In the Office Action the Examiner noted informalities in the drawings, in particular in Figs. 2 and 4. A replacement sheet for Figure 2 is now provided that includes reference numeral 24, which was inadvertently omitted from the original. A replacement sheet is also provided for Figure 4. This is now a formal drawing, which is believed to be more quickly comprehensible than the original hand-drawn figure. However, it is respectfully believed, that while perhaps eye-straining to some, original Figure 4 is not illegible.

New matter was not added in amending the drawings. It is respectfully requested that the replacement drawings be entered into the records of the application.

The claims were rejected for informalities such as containing subject matter not adequately described in the specification. It is respectfully submitted that a person with even the most rudimentary knowledge of DC circuitry, knowing the difference between series and parallel connection of circuit elements, would upon reading the application be able to make and use the invention of claim 1. In its essence, claim 1 describes a buss that splits into a plurality of parallel branches; each branch has a switch in it that can physically open a gap along the associated branch so an open branch does not allow electrical current and heat flow. An interface unit selectively operates the switches. A person skilled in the art would upon reading the application be readily able to make and use the inventions of claims 1-14.

The specification does not disclose any actual numeric values of "cross-section area" because the actual areas would depend on the particular installation, current load, lead materials, high and low temperature differential, etc., etc. But in every usage of the invention, the basic principles apply, namely, that the low temperature buss has a cross-section area for current flow, designated generically as A in the specification and in Figure 4. Further, the relationship between the buss area A and the areas of parallel leads (of quantity n) that connect between the low and high temperature busses is established throughout the specification and claims. Namely, the remaining current flow cross-

section area of connected leads is less than A when even one of the n leads is electrically open. (Please see the specification at page 1, last paragraph; page 2, first paragraph.)

Therefore, it is respectfully submitted that the broad objection to claims 1-14 for informality is inappropriate in this case and should be withdrawn.

The informalities noted by the Examiner with regard to claims 1 & 12, 7, and 8, are on-point and greatly appreciated. In amending the claims above, the words “reversibly”, and “fixedly” have been removed from all claims (including claim 5) where they appeared. The phrase in parentheses in claim 8 has been removed.

Minor changes have been made to the claims to clarify antecedent bases primarily with regard to the quantity n of parallel leads. Additionally, the specification was amended by adding a new paragraph at page 5 to state the inherent fact that when there are n parallel electrical elements, n must have a value of at least 2. Otherwise, there can not be parallel elements.

All of the amendments and the changes to the specification and drawings are made without addition of new matter.

Claims 1 – 3, and 10 -14 are rejected under 35 USC 102 as anticipated by the patent to Roy (4,906,861). Further, in that rejection the Examiner regards $n=0$, which as stated above, is not physically possible with a plurality of parallel leads. Accordingly, it is respectfully submitted that the rejection is inappropriate and should be withdrawn.

Additionally, it should be understood that this invention has primarily to do with heat transfer from a higher temperature buss to a lower temperature buss. Changing the quantity of parallel leads in proportion to the quantity of current flow through the busses, is done to reduce the area of the leads to thereby reduce the heat flow from hot to cold. At low temperatures, as are contemplated in this application, the costs of refrigeration are tremendously high especially when there is a high current application as, for example, in

electric motor propulsion in a warship. (The refrigeration system must remove (1) I^2R losses, (2) heat energy expended in operating the refrigeration system, and (3) in-leakage of heat including heat conducted in through the connecting busses. Without the present invention, the conductive buss losses continue and therefore the cooling system must operate even when there is no electrical current flowing. The present invention reduces these conductive buss heat flows.)

Thus, the invention is reduction of heat flow, and it is accomplished by changing the conductive heat flow of the parallel leads by changing the active number of current-carrying parallel leads. (Please see the specification at page 2, last two lines through page 3, line 14.) Accordingly, the controllable change in conductive flow area is not a “mere change” in size as the Examiner suggests, but is the novelty of the invention.

Additionally, it should be noted that the Roy patent has nothing to do with the flow of heat from hot to cold, and how to reduce that flow. Roy is concerned with switching superconductive current flow, relying on the manipulation of superconductive/non-superconductive properties of the elements, to avoid the use of mechanical switches when it is desired to reverse the flow of superconductive current. It is a reference that is not analogous in structure or purpose with the present invention. In Roy, there are no comparable n parallel leads (2 or more) having their sum heat flow area controllably variable in relation to the magnitude of current flow.

For these structural reasons, it is respectfully submitted that the invention here is not anticipated by Roy under 35 USC 102 and the rejection should be withdrawn. It is further respectfully submitted that the invention is not suggested by, or made obvious by the cited reference and the claims 1-3 and 10-14 are in condition for allowance.

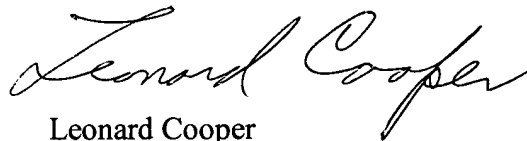
The rejections under 35 USC 103 are based on Roy in combination with other cited art. The above comments on Roy apply equally to the 103 art. It is respectfully submitted that the claims rejected under 35USC 103 are allowable if only for their dependencies, and also for the un-analogous nature of Roy and the other cited art.

An earnest effort has been made to be fully responsive to the Examiner's objections. In view of the above amendments, drawing changes, and remarks, it is believed that claims 1 – 14 are in condition for allowance as amended. Passage of this case to allowance is earnestly solicited.

However, if for any reason the Examiner should consider this application not to be in condition for allowance, he is respectfully requested to telephone the undersigned attorney at the number listed below prior to issuing a further Action.

A fee for a two month time extension is enclosed.

Respectfully submitted,

A handwritten signature in cursive script that reads "Leonard Cooper".

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IN THE DRAWINGS

Figure 2 is herein amended with a replacement sheet by addition of reference numeral 24 to identify power buss.

Figure 4 is herein amended with a replacement sheet that provides a formal drawing in substitution for the originally filed hand drawing.

In each figure, new matter was not added.